4. The method of claim 1, wherein said silicon-containing component comprises silane.

5. The method of claim 1, wherein said oxygen-containing component comprises no more than 21% total concentration by volume of said gas mixture.

6. The method of claim 1, wherein said oxygen-containing component is at a flow rate between about 72 sccm and about 105 sccm.

7. The method of claim 1, wherein said oxygen-containing component comprises O_2.

8. The method of claim 1, wherein said gas mixture is further comprised of an inert component.

C2 CONT'D.

9. The method of claim 8, wherein said inert component is at a flow rate between about 305 sccm and about 358 sccm.

10. The method of claim 8, wherein said inert component comprises helium.

11. The method of claim 1, wherein said ratio is below approximately 1.2

12. The method of claim 1, wherein said ratio is between about 1.0 and about 1.2.

13. The method of claim 1, wherein said gas mixture is at a pressure between about 3.5 mTorr and about 5.5 mTorr.

14. The method of claim 1, wherein the dielectric is deposited over said gaps at an etch-to-deposition ratio between about 0.0 and about -0.05.

15. The method of claim 1, wherein the dielectric comprises silicon oxide.

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16. The method of claim 1, wherein the dielectric has a refractive index of about 1.46.

17. The method of claim 1, further comprising:

providing a low frequency power source operable to form plasma from said gas mixture, said low frequency power source providing power at between about 4.2 kW and about 5.0 kW.

18. The method of claim 1, further comprising:

providing a high frequency power source operable to bias a substrate, said high frequency power source providing power at between about 1.0 kW and about 1.4 kW.

19. A method for filling a gap during integrated circuit fabrication, comprising:

providing a gas mixture comprised of silicon-containing and oxygen-containing components;

selecting a flow rate of said silicon-containing component;

providing a minimum flow rate of said oxygen-containing component to allow formation of a film having a refractive index of about 1.46; and

filling said gap by depositing said film over said gap using said gas mixture for simultaneous high density plasma chemical vapor deposition and sputter etching.

20. The method of claim 19, wherein said silicon-containing component is at a flow rate between about 70 sccm and about 90 sccm.

21. The method of claim 19, wherein said silicon-containing component comprises silane.

22. The method of claim 19, wherein said oxygen-containing component is at a flow rate between about 72 sccm and about 105 sccm.

23. The method of claim 19, wherein said oxygen-containing component comprises O_2.

24. The method of claim 19, wherein said gas mixture is further comprised of an inert component.

25. The method of claim 24, wherein said inert component is at a flow rate between about 305 sccm and about 358 sccm.

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26. The method of claim 24, wherein said inert component comprises helium.

27. The method of claim 19, wherein a ratio of said oxygen-containing component to said silicon-containing component is below approximately 1.2.

28. The method of claim 19, wherein a ratio of said oxygen-containing component to said silicon-containing component is between about 1.0 and about 1.2.

29. The method of claim 19, wherein said film is deposited over said gaps at an etch-to-deposition ratio between about 0.0 and about -0.05.

30. A method for filling gaps during integrated circuit fabrication, comprising:

providing a gas mixture comprised of oxygen-containing and silicon-containing components, said gas mixture having a ratio of said oxygen-containing component to said silicon-containing component below about 1.3; and

filling said gaps by using said gas mixture for simultaneous high density plasma chemical vapor deposition and sputter etching.

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